

What is claimed is:

1. An ultrasonic-motor control system comprising:

an ultrasonic motor;

5 a controller which starts said ultrasonic motor by changing a drive frequency of said ultrasonic motor from an initial drive frequency;

10 a calculation device which calculates an initial drive frequency data based on a drive frequency at the commencement of rotation of said ultrasonic motor; and

a setting device which sets said initial drive frequency based on said initial drive frequency data at a subsequent commencement of driving of said ultrasonic motor.

15 2. The ultrasonic-motor control system according to claim 1, wherein said controller starts said ultrasonic motor by reducing a drive frequency of said ultrasonic motor from an initial drive frequency.

20 3. The ultrasonic-motor control system according to claim 1, further comprising:

a frequency data storing device in which a drive frequency at the commencement of rotation of said ultrasonic motor is stored as starting frequency data each time said ultrasonic motor starts;

25 wherein said calculation device calculates an

average of all said starting frequency data stored in said frequency data storing device, and calculates said initial drive frequency data using said average.

4. The ultrasonic-motor control system according to claim 3, wherein said frequency data storing device stores a resonance frequency data of said ultrasonic motor; and

wherein said calculation device utilizes the resonance frequency data to calculate a value which is added to said average in order to obtain said initial drive frequency data.

5. The ultrasonic-motor control system according to claim 4, wherein each time a rotational speed of said ultrasonic motor reaches a maximum rotational speed, said frequency data storing device stores a drive frequency as said resonance frequency data.

6. The ultrasonic-motor control system according to claim 3, wherein said initial drive frequency data is greater than said average by a predetermined ratio.

7. The ultrasonic-motor control system according to claim 3, wherein said setting device sets said initial drive frequency to a maximum value in a controllable frequency range of said controller in the case where none of said starting frequency data is stored in said frequency data storing device.

8. The ultrasonic-motor control system according to claim 3, wherein in the case where said ultrasonic motor does not start though said controller decreases said drive frequency of said ultrasonic motor to a minimum frequency
5 in a controllable frequency range of said controller,

said controller clears all said starting frequency data stored in said frequency data storing device, and said setting device sets said initial drive frequency to a maximum value in a controllable frequency range of said
10 controller.

9. The ultrasonic-motor control system according to claim 3, further comprising:

a rotational speed determining device which determines a rotational speed of said ultrasonic motor,
15 upon a predetermined time elapsing from said commencement of rotation of said ultrasonic motor, each time said ultrasonic motor starts;

a rotational speed storing device in which said rotational speed is stored as speed data, wherein at least
20 a previous speed data and a current speed data are stored in said rotational speed storing device; and

a determining device which determines whether a speed-data difference between the previous speed data and the current speed data is one of equal to and greater than
25 a predetermined value;

wherein said controller clears all said starting frequency data stored in said frequency data storing device in the case where said determining device determines that said speed-data difference is one of equal to and greater than said predetermined value.

10. The ultrasonic-motor control system according to claim 9, wherein said setting device sets said initial drive frequency to a maximum value in a controllable frequency range of said controller in the case where none of said starting frequency data is stored in said frequency data storing device.

11. The ultrasonic-motor control system according to claim 9, further comprising:

a temperature sensor for sensing an ambient temperature of said ultrasonic motor before each time said controller starts said ultrasonic motor; and

a temperature data storing device in which said ambient temperature is stored as temperature data, wherein at least a previous temperature data and a current temperature data are stored in said temperature data storing device;

wherein said determining device determines whether a temperature-data difference between the previous temperature data and the current temperature data is one of equal to and greater than a predetermined value,

wherein said controller clears all said starting frequency data stored in said frequency data storing device in the case where said determining device determines that said temperature-data difference is one
5 of equal to and greater than said predetermined value.

12. The ultrasonic-motor control system according to claim 11, wherein said setting device sets said initial drive frequency to a maximum value in a controllable frequency range of said controller in the case where none
10 of said starting frequency data is stored in said frequency data storing device.

13. The ultrasonic-motor control system according to claim 3, further comprising:

a temperature sensor for sensing an ambient
15 temperature of said ultrasonic motor before each time said controller starts said ultrasonic motor;

a temperature data storing device in which said ambient temperature is stored as temperature data, wherein at least a previous temperature data and a current
20 temperature data are stored in said temperature data storing device; and

a determining device which determines whether a difference between the previous temperature data and the current temperature data is one of equal to and greater
25 than a predetermined value;

wherein said controller clears all said starting frequency data stored in said frequency data storing device in the case where said determining device determines that said difference is one of equal to and
5 greater than said predetermined value.

14. The ultrasonic-motor control system according to claim 13, wherein said setting device sets said initial drive frequency to a maximum value in a controllable frequency range of said controller in the case where none
10 of said starting frequency data is stored in said frequency data storing device.

15. The ultrasonic-motor control system according to claim 3, wherein said initial drive frequency data is stored in said frequency data storing device.

16. The ultrasonic-motor control system according to claim 3, wherein said frequency data storing device stores the current said starting frequency data and a predetermined number of previous said starting frequency data.
15

17. The ultrasonic-motor control system according to claim 1, wherein said setting device compares said calculated initial drive frequency with a maximum drive frequency in a controllable frequency range of said controller, and
20

wherein said setting device sets said initial drive
25

frequency to said maximum drive frequency in the case where said calculated initial drive frequency is higher than said maximum drive frequency.

18. The ultrasonic-motor control system according
5 to claim 1, wherein said ultrasonic-motor control system is incorporated in a camera system.

10034391.010303
SECRET